UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/559,517	04/07/2006	Martin Daferner	710.1033	5250

23280 7590 04/01/2009

Davidson, Davidson & Kappel, LLC
485 7th Avenue
14th Floor
New York, NY 10018

EXAMINER	
OCHOA, JUAN CARLOS	
ART UNIT	PAPER NUMBER
2123	
MAIL DATE	DELIVERY MODE
04/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/559,517	DAFERNER, MARTIN	
	Examiner	Art Unit	
	JUAN C. OCHOA	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/06/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 21–40 are presented for examination.

Specification

2. The abstract of the disclosure contains more then 150 words. Applicant is reminded of the proper language and format for an abstract of the disclosure. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided.

3. The disclosure is objected to because it contains a reference to non–existing claim 2, see page 9, paragraph [0034], line 3.

4. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code, see paragraphs [0064,67,68,117]. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: claim 40 recites "a computer program product stored on a

computer readable medium". The subject matter description of "program product" and "readable medium" in the specification is non-existing.

Claim Objections

6. Claim 21, line 3 includes the term "to produce a layer between in each case two bodies of the system", meaning is unclear. Examiner interprets as "to produce a layer between every two bodies of the system" for examination purposes.

7. Claim 21, lines 8–11 include the term "selecting for each surface pair that includes two different surfaces of the design model all the element pairs that in each case one finite element of one surface, and of one finite element of the other surface of the surface pair, and whose spacing from one another is smaller than or equal to a prescribed upper bound", meaning is unclear. Examiner interprets as "selecting for each surface pair that includes two different surfaces of the design model all the element pairs whose spacing from one another is smaller than or equal to a prescribed upper bound" for examination purposes.

8. Claims refer to the terms "a prescribed upper bound", "the prescribed bounds", "the bound", and "the upper bound". Terms may raise antecedent basis issues. The lack of antecedent basis makes the scope of the claims indeterminate or indefinite, since it is uncertain as to the bound to which reference is made. See § MPEP 2173.05(e). References to the same limitations should remain consistent throughout the claim to avoid any confusion.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 22–24 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 22 recites the limitation "those node pairs are selected whose nodal points have a spacing that is smaller than or equal to **the bound**" in lines 8–9. There is insufficient antecedent basis for the limitation "the bound" in the claim. Parent claim calls for "a prescribed upper bound" and "positions and orientations of the two finite elements with prescribed bounds". The lack of antecedent basis makes the scope of the claim indeterminate or indefinite, since it is uncertain as to the bound to which reference is made. See § MPEP 2173.05(e). References to the same limitations should remain consistent throughout the claim to avoid any confusion.

12. Claim 39 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 39 is directed to "a computer program product loadable directly into an internal memory of a computer and comprising sections of software capable of executing on the computer the method", which fails to fall into one of the categories of invention. It is unclear what applicant is claiming.

13. Dependent claims inherit the defect of the claim from which they depend.

Claim Rejections - 35 USC § 101

14. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

15. Specifically, claim 39 claims "a computer program product loadable directly into an internal memory of a computer and comprising sections of software capable of executing on the computer the method", which fails to fall into one of the categories of invention. "A computer program product loadable directly into an internal memory of a computer and comprising sections of software" is not a process, machine, manufacture or composition of matter, thus does not fall within any of the statutory categories of invention.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. Claims 21–27, 29, 31–33 and 35–40 are rejected under 35 U.S.C. 103(a) as being unpatentable over James A. St. Ville, (St. Ville hereinafter), U.S. Patent 7,203,628, taken in view of Jasuja et al., (Jasuja hereinafter), U.S. Patent 6,766,206.

19. As to claim 21, St. Ville discloses a method for automatically detecting connectable surfaces in a technical system, the system including a plurality of bodies, a joining technology being prescribed, and a computerized design model of the system being given that, for each body of the system, includes at least one surface belonging to the body, the method having the steps of: producing finite elements for the surfaces (see col. 5, line 42 to col. 6, line 20), selecting for each surface pair that includes two different surfaces of the design model all the element pairs that in each case one finite element of one surface, and of one finite element of the other surface of the surface pair, and whose spacing from one another is smaller than or equal to a prescribed upper bound (see col. 1, line 65 to col. 2, line 9), deciding for each selected element pair whether the two finite elements of the element pair can be connected by the joining technology, the deciding including applying a computer-evaluable decision criterion that compares at least one of the spacings, positions and orientations of the two finite elements with prescribed bounds (see col. 7, lines 36–50).

20. While St. Ville discloses a joining technology, St. Ville fails to disclose the joining technology capable of being applied to produce a layer between in each case two bodies of the system (which Examiner interprets as "to produce a layer between every two bodies of the system" for examination purposes).

21. Jasuja discloses the joining technology capable of being applied to produce a layer between in each case two bodies of the system (see col. 4, lines 10–49).

22. St. Ville and Jasuja are analogous art because they are related to design via FEA.

23. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the steps of Jasuja in the method of St. Ville because Jasuja develops a system and a method for designing an automotive body structure which optimizes the use of adhesive bond technology within the body structure (see col. 2, lines 9–12), and as a result, Jasuja reports the following improvements over his prior art: allowing an individual to relatively quickly design a body structure having a minimum weight and optimized amounts and placement of adhesive within the body structure and to optimize the body structure without wasteful experiments using actual components and materials; thereby minimizing the cost and time required to design a body structure (see col. 6, lines 32–40).

24. As to claim 22, St. Ville discloses a method as recited in claim 21 wherein the selecting step includes that when selecting the element pairs of a surface pair all the nodal points of the finite elements of the two surfaces are determined (see col. 6, lines 40–42), all the node pairs that consist in each case of one nodal point of one surface and one nodal point of the other surface are determined, the spacing between the two nodal points of the node pair is calculated for each node pair (see col. 7, lines 51–55), those node pairs are selected whose nodal points have a spacing that is smaller than or equal to the bound, and each element pair is determined whose one finite element has one nodal point of a selected node pair as a nodal point, and whose other finite element has the other nodal point of the same node pair as a nodal point, and determined element pairs are used as selected element pairs (see col. 9, lines 35–65).

25. As to claim 23, St. Ville discloses a method as recited in claim 22 wherein each determined element pair is preselected whenever each nodal point of one finite element of the element pair has a spacing from at least one nodal point of the other finite element that is smaller than or equal to the prescribed upper bound, each preselected element pair is selected whenever the spacing between the two finite elements of the element pair is smaller than or equal to the upper bound, and a decision is made for each non-preselected element pair that the two finite elements of the element pair are not connectable (see col. 9, lines 35–65).

26. As to claim 24, St. Ville discloses a method as recited in claim 22 wherein each determined element pair is preselected whenever each nodal point of one finite element of the element pair has a spacing from all nodal points of the other finite element that is smaller than or equal to the prescribed upper bound, each preselected element pair is selected whenever the spacing between the two finite elements of the element pair is smaller than or equal to the upper bound, and a decision is made for each non-preselected element pair that the two finite elements of the element pair are not connectable (see col. 9, lines 35–65).

27. As to claim 25, St. Ville discloses a method as recited in claim 21 wherein the selecting step includes that whenever the spacing between the two finite elements of the element pair is greater than a prescribed bound the element pair is not selected (see col. 9, lines 35–65).

28. As to claim 26, St. Ville discloses a method as recited in claim 21 wherein the deciding step includes comparing the spacing between the two finite elements of the element pair, and when comparing the spacing of the two finite elements of the element

pair with a prescribed upper and/or lower bound at least one of the following sequences is carried out (see col. 9, lines 35–65): determining the point of intersection of the two diagonals of one finite element, determining the point of intersection of the two diagonals of the other finite element, determining the spacing between the two points of intersection, erecting a normal to one finite element of the element pair, determining the foot point of the normal in the finite element, determining the point of intersection of the normal with the other finite element, comparing the spacing between foot point and point of intersection with a prescribed upper and/or lower bound, erecting a normal to one finite element and a normal to the other finite element of the element pair, determining the sum vector of the two normals, determining the point of intersection of a straight line in the direction of the sum vector with the other finite element, calculating the spacing between point of intersection of the straight line with one finite element and point of intersection of the straight line with the other finite element, comparing the spacing with a prescribed upper and/or lower bound, for each nodal point of one finite element of the pair, erecting a normal through the nodal point on the finite element, determining the point of intersection of the normal with the other finite element, comparing the spacing between nodal point and point of intersection with a prescribed upper and/or lower bound (see col. 7, lines 9–35).

29. As to claim 27, St. Ville discloses a method as recited in claim 21 wherein when taking a decision for the selected element pair at least one of the following tests is carried out: testing if the finite elements of the element pair belong to surfaces of different bodies, determining the angle between the two finite elements of the element pair and comparing the angle with a prescribed upper bound, projecting one finite

element of the element pair along a projection vector and testing whether the projected finite element overlaps with the other finite element or not, determining the midpoints of the two finite elements of the element pair, projecting one finite element along a projection vector, determining the spacing between the midpoint of the projected finite element and the midpoint of the other finite element, comparing the spacing with the prescribed upper bound, determining the midpoints of the two finite elements of the element pair, projecting one finite element along a projection vector, determining the spacing between the midpoint of the projected finite element and the midpoint of the other finite element, determining the length of the longest edge of the two finite elements of the pair, comparing the quotient of spacing and longest edge length with the prescribed upper bound (see col. 7, lines 9–35).

30. As to claim 29, St. Ville discloses a method as recited in claim 21 wherein the prescribed bounds depend on at least one of the following parameters: a technical parameter of the prescribed joining technology, the nature of a surface of one of the bodies, a technical parameter of a material provided for producing one of the bodies, and a stipulation valid for all the bodies of the system (see col. 1, lines 22–34; col. 9, lines 35–65).

31. As to claim 31, Jasuja discloses a method as recited in claim 21 wherein various possible joining technologies are prescribed, and for each possible joining technology, a decision criterion is prescribed that compares the positions and/or orientations of two finite elements with prescribed bounds dependent on the joining technology, and an evaluation of the joining technology are prescribed, the pairs of finite elements connectable by the joining technology are determined for each joining technology, the

decision criterion prescribed for the joining technology being applied to the finite elements of the pair during the determination, an evaluation of the joining technology with reference to the system is determined by applying an evaluation function calculated from the prescribed evaluation of the joining technology and the element pairs connectable with the aid of the joining technology, that a specific joining technology is selected for which the highest evaluation was determined with reference to the system, and the further finite elements are generated in the interspaces that are delimited by those element pairs connectable with the aid of the selected specific joining technology (Fig. 2).

32. As to claim 32, St. Ville discloses a method as recited in claim 21 further comprising automatically generating further finite elements in the interspaces delimited by the finite elements detected as being connectable (see col. 6, line 40 to col. 7, line 8).

33. As to claim 33, St. Ville discloses a method as recited in claim 32 wherein the further finite elements are volume elements in the interspaces, the volume elements being generated in such a way that all the interspaces are fully meshed by volume elements, and the meshing is produced by using geometric information relating to the interspaces and stipulations for the meshing (see col. 6, line 40 to col. 7, line 8).

34. As to claim 35, St. Ville discloses a method as recited in claim 32 further comprising setting up, in accordance with the finite element method, a system of equations with unknowns being values assumed by a spatially variable physical quantity at the nodal points of the generated finite elements, and the values of the quantity at the

nodal points are determined by a numerical solution of the system of equations (see col. 1, lines 59–64).

35. As to claim 36, St. Ville discloses a method as recited in claim 35 wherein for a set of nodal points of further finite elements in the interspaces, there are respectively determined a closest surface of the design model, a closest finite element of this surface, and a closest point on this finite element, and equations for physical relationships between the values that the physical quantity assumes in the set of nodal points, and the values that the physical quantity at the closest points, determined for the set, of the surfaces are generated and used when setting up the system of equations (see col. 7, line 50 to col. 8, line 10).

36. As to claim 37, St. Ville discloses a method as recited in claim 35 wherein for at least one nodal point of the set, a function is generated for a physical relationship between the value that the physical quantity assumes at the closest point and the values that this quantity assumes at the nodal points of the closest finite element, and the value of the physical quantity at the determined point is eliminated by using the function when setting up the system of equations (see col. 7, line 9 to col. 8, line 18).

37. As to claim 38, St. Ville discloses a method as recited in claim 21 further comprising determining a total volume in interspaces between all the connectable element pairs (see col. 6, lines 21–27).

38. As to claim 39, St. Ville discloses a computer program product loadable directly into an internal memory of a computer and comprising sections of software capable of executing on the computer the method as recited in claim 21 (see col. 1, lines 11–14).

39. As to claim 40, St. Ville discloses a computer program product stored on a computer readable medium and comprising a computer readable program prompting a computer to execute the method as recited in claim 21 (see col. 1, lines 11–14).

40. Claims 28 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over St. Ville taken in view of Jasuja as applied to claim 27 above, and further in view of Dohrmann et al., (Dohrmann hereinafter), U.S. Patent 6,560,570.

41. As to claim 28, while the St. Ville–Jasuja method discloses carrying out a test when taking a decision for the selected element pair, the St. Ville–Jasuja method lacks a projection vector generated as sum vector from a normal to one finite element, and a normal of equal length to the other finite element, and the angle between the two finite elements is generated as angle between a normal to one finite element and a normal to the other finite element.

42. Dohrmann discloses a method as recited in claim 27 wherein the projection vector is generated as sum vector from a normal to one finite element, and a normal of equal length to the other finite element, and the angle between the two finite elements is generated as angle between a normal to one finite element and a normal to the other finite element (see col. 2, lines 20–42).

43. St. Ville, Jasuja, and Dohrmann are analogous art because they are related to design via FEA.

44. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the step of Dohrmann in the St. Ville–Jasuja method because Dohrmann connects dissimilar finite element meshes (see col. 2, lines

21–22), and as a result, Dohrmann reports the following improvements over his prior art: the freedom to designate master and slave surfaces independently of the resolutions of the two meshes, standard practice is to designate the master surface as the surface with fewer numbers of nodes, and improved accuracy can be achieved in certain instances by allowing the master surface to have the greater number of nodes (see col. 2, lines 30–37).

45. As to claim 34, Dohrmann discloses a method as recited in claim 32 wherein at least one further finite element in an interspace is a planar element perpendicular to an adjoining surface of the design model (see col. 2, lines 20–42).

46. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over St. Ville taken in view of Jasuja as applied to claim 21 above, and further in view of Thorsten Böger & Gerhard Schmöller, "Finite Element Analyses Of Structural Glazing Elements In Civil Engineering And Adhesively Bonded Windshields In Automotive Engineering - A Comparison"

47. As to claim 30, while the St. Ville–Jasuja method discloses a joining technology, the St. Ville–Jasuja method fails to expressly disclose either layer joining or inserting a spacing layer joining.

48. Böger discloses a method as recited in claim 21 wherein the prescribed joining technology includes one of the following methods: layer joining, and inserting a spacing layer joining (see pages 1, 2, 4, 6, and 7; especially "FEM aspects with Direct Glazing" in pages 6 and 7).

49. St. Ville, Jasuja, and Böger are analogous art because they are related to design via FEA.

50. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the technology of Böger in the St. Ville–Jasuja method because Böger discusses the possibilities of Finite Element Analyses, taking as an example structural glazing facades in civil engineering and adhesively bonded windshields (direct glazing) in automotive industries (see page 1, 2nd–4th paragraphs), and as a result, Böger reports the following main advantage over his prior art: the possibility of taking three dimensional stress and strain states into account leads to optimizations in order to avoid critically stressed regions (see page 4, 3rd–4th paragraphs).

Conclusion

51. Examiner would like to point out that any reference to specific figures, columns and lines should not be considered limiting in any way, the entire reference is considered to provide disclosure relating to the claimed invention.

52. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan C. Ochoa whose telephone number is (571) 272-2625. The examiner can normally be reached on 7:30AM - 4:00 PM.

53. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

54. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

***
/J. C. O./ 3/25/09
Examiner, Art Unit 2123

/Paul L Rodriguez/
Supervisory Patent Examiner, Art Unit 2123